

Planet.	Rises.		Sets.		Right asc. and declination on meridian.	
	h. m.	h. m.	h. m.	h. m.	h. m.	°
Mercury...	8 30	13 15	18 0	13 49.4	14	59 S.
Venus....	2 44	9 46	16 48	10 19.9	11	18 N.
Mars .....	2 49	9 51	16 53	10 24.8	11	18 N.
Jupiter...	13 35	17 27	21 19	18 1.6	23	30 S.
Saturn....	2 23	9 34	16 45	10 7.0	12	56 N.
Uranus...	7 22	12 46	18 10	13 19.8	7	48 S.
Neptune..	19 50*	3 39	11 28	4 11.2	19	24 N.

\* Indicates that the rising is that of the preceding evening.

Oct.	h.	
1	11	Jupiter in conjunction with and 0° 39' south of the Moon.
1	13	Venus in conjunction with and 0° 22' south of Mars.
4	1	Mercury stationary.

Variable Stars.

Star.	R.A.		Decl.	h.	m.
	h. m.	°			
S Ceti ...	0 18.4	9 57 S.	Oct. 1,		M
U Cassiopeiæ ...	0 40.2	47 39 N.	„ 3,		M
U Cephei ...	0 52.5	81 17 N.	„ 5,	3 26	m
Algol ...	3 1.0	40 32 N.	„ 4,	3 45	m
λ Tauri ...	3 54.5	12 11 N.	„ 5,	0 59	m
U Boötis ...	14 49.2	18 9 N.	Sept. 30,		M
S Herculis ...	16 46.8	15 8 N.	„ 29,		M
U Ophiuchi...	17 10.9	1 20 N.	„ 29, 20	52	m
			Oct. 4,	21 38	m
Y Sagittarii ...	18 14.9	18 55 S.	Sept. 29,	21 0	m
R Scuti ...	18 41.6	5 20 S.	Oct. 3,		M
β Lyræ... ..	18 46.0	33 14 N.	„ 4,	0 30	M
R Cygni ...	19 33.8	49 57 N.	„ 4,		M
S Aquilæ ...	20 6.5	15 18 N.	„ 3,		m
R Delphini ...	20 9.6	8 45 N.	„ 1,		M
T Vulpeculæ ...	20 46.8	27 50 N.	Sept. 30,	23 0	m

M signifies maximum; m minimum.

Meteor-Showers.

	R.A.	Decl.		
Near η Aurigæ ...	75	41 N.	October 2.	Swift.
	225	52 N.	October 2.	Slow, bright.
„ δ Draconis ...	290	68 N.		Swift.

GEOGRAPHICAL NOTES.

ON the 12th inst. the administration of the Congo State received intelligence by way of Zanzibar that Mr. H. M. Stanley, on leaving the basin of the Albert Nyanza, endeavoured to make his way southwards by passing to the west of the Victoria Nyanza, but was unsuccessful. He then went northwards, and reached the eastern shore of the lake, Emin Pasha accompanying him. Mr. Stanley made a long stay on the borders of the lake, awaiting supplies from Msalala and Jabora, for which he had sent. He left Emin Pasha on the eastern shore of the lake several months ago, and proceeded in the direction of Mombassa. Mr. Stanley is expected to reach the eastern coast of Africa towards the end of October next.

ACCORDING to information received at Lloyd's from Tromsø, dated September 9, the German travellers Kukenthal and Walter, belonging to the Bremen Arctic Expedition, who were shipwrecked last spring in the *Bertina*, have arrived safely at Tromsø.

M. JOSEPH MARTIN, the French explorer, known in connection with his late expedition to Eastern Siberia, recently left Pekin with a small escort for Tibet, intending to proceed along the Great Wall, subsequently passing through the towns of Liang-Chow and Sining and the province of Koko-Nor, where he expects to arrive next spring. The object of the expedition is of a purely scientific character.

MR. FREDERICK JEPPE, of Pretoria, has recently issued, through Lulau and Co., an excellent map of the Transvaal and neighbouring territories on the scale of 15 78 miles to an inch. It includes not only the Transvaal, but the Orange Free State and all the countries between these and the coast, from Delagoa Bay down to Pondoland. It goes north to close on the

Zambesi, including Matabeleland, Bechuanaland, Griqualand West, and the northern parts of Cape Colony. There are, moreover, a number of special inset maps. The physical features, mountains, rivers, &c., are laid down clearly and in detail. The gold-fields are coloured yellow, the topography is almost exhaustive, and the map is really a gazetteer of the extensive and important region which it embraces. Mr. Jeppe gives a list of the various authorities which he has used in the compilation of his map, and these are the best and latest available.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, September 9.—M. Des Cloizeaux, President, in the chair.—On the fixation of atmospheric nitrogen, by M. Berthelot.—Observations on the formation of ammonia and volatile azotised compounds at the expense of vegetable earth and of plants, by the same. He traces the researches, initiated by him six years ago, establishing the fixation, by earth and plants, of free nitrogen of the air, with the aid of mineral matters and living organisms. Analysis of the liquid condensed within a bell jar inclosing earth, or earth with vegetation, proves the exhalation (of ammonia, &c.) above referred to; and like the ptomaines, &c., produced by animals in a closed space, the products are toxic to the organisms yielding them.—On the nitrification of ammonia, by M. Th. Schloësing. Small quantities of gaseous nitrogen (negligible in agricultural practice), are liberated during the oxidation of ammonia in soil. The author shows that the nitrification of ammonia put into a soil in the form of sulphate, may be effected very quickly, when favoured by the nature of the soil, its humidity and its temperature. In slow combustion of the organic matter of soil, through the agency of the nitric ferment, much more oxygen is used in burning the carbon and hydrogen, than in nitrification of the nitrogen. But in a soil enriched with ammonia, the activity of the ferment is much increased, in conveying oxygen to the ammonia, and it seeks from organic matter only the carbon needed for its development and multiplication.—On the bacteriological study of the lesions of contagious peripneumonia of the ox, by M. S. Arloing. He distinguishes a bacillus and three kinds of micrococci.—On some observations made at the Observatory of Algiers, by M. Ch. Trépiéd. The separation of the nucleus of Brooks's comet, affirmed by the Mount Hamilton observers, could not be certainly made out. This Observatory, begun in the spring of 1885, on a height (350 metres) overlooking Algiers, has now all its instruments except a photographic equatorial. M. Trépiéd notes that the telescopic image of a star, during the sirocco, becomes a continuous luminous spot, the intensity diminishing outwards; an effect, doubtless, of dust.—Observations of Brooks's comet and its companion, made at the Observatory of Algiers with the 0.50 m. telescope, by MM. Rambaud and Sy.—The spectro-photography of the invisible parts of the solar spectrum, by M. Ch. V. Zenger. He describes as advantageous combinations, prisms of quartz and anethol; of quartz and calcareous spar; of the latter and sulphide of carbon; and of rock salt and anethol. One prism of rock salt, with two of anethol, gives nine times more dispersion, and the red part is six times more dispersed between A and D, than by a 60° prism of rock salt.—Researches on sulphites, by M. P. J. Hartog.—On a new monobromized camphor; on the constitution of monosubstituted derivatives of camphor, by M. P. Cazeneuve. The new compound is obtained similarly to the chlorine compound, got by the action of hypochlorous acid, and has similar properties.—On phenoldisulphonic acid, by M. S. Allain-Le Canu.—Influence, on bare soil, of gypsum and clay, on the conservation of nitrogen, the fixation of atmospheric nitrogen, and nitrification, by M. Péchard. The sulphate of lime retains the ammonia in the state of sulphate, and contributes indirectly to the production of nitric acid, by keeping the nitrogen in a form easily nitrifiable; also directly, (in a way not well understood) by its power of deoxidation and reoxidation. Gypsum and clay, both added to sandy soil, concur in fixing ammonia; the former keeps the fixing power of the latter active by removing its ammonia in the state of sulphate easily nitrifiable (clay alone is rather adverse to nitrification).—Manufacture of red glasses for windows (twelfth and thirteenth centuries), by MM. Ch. Er. Guignet, and L. Magne. A microscopic examination of these old glasses shows.

that various effects were obtained by making two glasses act on each other. In one case of interior twisted marbling, e.g., a yellowish glass (charged with iron protoxide) reddened only at its contact with the enveloping mass of greenish-blue glass (copper-oxide). In another case (parallel marbling), each pellicle of yellow glass is reddened at its two faces. M. Henrivaux has adopted a similar method at St. Gobain.

September 16.—M. Des Cloizeaux, President, in the chair.—On an adynamic gyrostatic constitution for the ether, by Sir William Thomson. He describes a system of small spheres, connected by rods, with terminal cups moving on the spheres, and, at their middle part, two gyroscopes, with outer rings at right angles to each other.—On an application of the electric transmission of force, made at Bourgneuf, by M. Marcel Deprez. Further details are given of the system, which has worked well since May. The high tension generator, driven by a turbine, has two rings on one shaft, excited by two rectilinear inductors parallel to the axis, having the four poles quite free. The receiver is similar. The machines for light are of the Gramme type; and with a line resistance of 23 ohms, about 50 per cent. of the force imparted to the generator is recovered in light.—Determination of the microbe producing contagious peripneumonia of the ox, by M. S. Arloing. Of the four he describes, he finds the *Pneumobacillus liquefaciens* (as he calls it) the essential element in the virus.—Observations of Brooks's comet and its companion, at Algiers Observatory, by M. Rambaud.—On the occultations of Jupiter's satellites, by M. Ch. André. With three different telescopes at Lyons, the time of contact determined differed to the extent of 2½ minutes; immersion being noted earlier, and emersion later, with the smaller instrument; also the apparent complete visibility of the satellite, continued after contact (as others have observed), is referred to. This is thought to be due to a zone of diffracted light, spread by the object-glass round the geometrical image of the planet, covering the focal image of the satellite.—On the calculations of Maxwell, relative to movement of a rigid ring round Saturn, by M. O. Callandreau.—On the heat of vaporization of carbonic acid near the critical point, by M. E. Mathias. He uses the heat of dilution of sulphuric acid in the water of the calorimeter, as a compensating source of heat, and finds Clapeyron's formula satisfactorily verified. At the critical point the latent heat, *L*, is rigorously *nil*.—On the use of the new Edison phonograph as a universal acoumeter, by M. Lichtwitz. With it, one may form *phonograms*, to serve as acoustic scales, with vowels, consonants, syllables, words and phrases, &c., according to their intensity and acoustic value (as determined by O. Wolf). The sound-source being nearly constant, could be used to compare the hearing of different patients, or the same patient at different times. A set of uniform phonograms could be got by placing phonographs at a fixed distance from a reproducing instrument. Thus aurists in all countries could compare results.—Catadioptric objectives applied to celestial photography, by M. Ch. V. Zenger. Two correction lenses of magnesium glass, of the same focal length, one concave and the other convex, are inserted, the focal length of the system being identical with that of the spherical mirror. The time of exposure is reduced to a third or a quarter, for stars of a given size.—Some supplementary thermal data, by M. J. Ossipoff. Thermal formation of salts of phenylene diamines, by M. Léo Vignon. Comparing the heat of neutralization of the three diamines by hydrochloric acid, he finds orthophenylene diamine to show less than the meta isomer; which, again, shows less than the para. The bisubstituted derivatives of benzene studied by Berthelot and Werner present a similar case.—On the alcoholic fermentation of honey and the preparation of hydromel, by M. G. Gastine. Solutions of honey generally give but poor alcoholic fermentation. The author verified an idea that this is because the ferments, in a medium so poor in mineral and azotized matters, miss the conditions necessary to their evolution.—Physiological action of the poison of the terrestrial salamander, by MM. Phisalix and Langlois. The characteristic symptom is convulsion; and the poison acts successively on the cortical, bulbar, and medullary cells. Temperature rises rapidly, and dyspnoea occurs, followed by asphyxia. Arterial tension is increased.—Cyclone of Jougae, on July 13, 1889, by M. Ch. Dufour. This appeared at 1.15 p.m., on a very hot, calm, cloudy day, in the canton of Doubs, and tore along eastwards 6 km., with a rattle like thunder, lasting two to three minutes. Of many trees uprooted, those at the outset lay mostly east to west; those further on, mostly west to east. The width of region devastated grew from 100 to 250 metres. The

intensity seems to have varied in this space, and to have been greater on the right than on the left side (probably through the velocity of translation being added to that of gyration in the former case). Curiously, the weather changed at the time of the cyclone, from dry and warm to cold and wet.

## STOCKHOLM.

Royal Academy of Sciences, September 11.—A new arrangement of the species of the cod-fishes, by Prof. A. F. Smitt.—On types of weather-maps, and on the latest dispositions as to the circulation of the meteorological observations of the Meteorological State Institute to the public in general, by Prof. R. Rubenson.—On the genus *Prisciturben*, Kunth, by Prof. G. Lindström.—Analytic construction of the integrals of a linear homogeneous differential equation of a circular ring, which does not include any singular place, by Prof. G. Mittag-Leffler.—Analytic construction of the invariants of a linear homogeneous differential equation, by the same.—Contribution to the history of the mathematical studies in Sweden during the sixteenth century, by Dr. G. Eneström.—On the constitution of the cumenyl-propin-acid, by Prof. O. Widman.—On hydro-canel-carbon-acid and some of its derivatives, by the same.—A contribution to the question of the readjustment of the atoms within the propyl group, by the same.—Derivatives of the ortho-amid-benzyl-alcohol, by Prof. Widman and Dr. Söderbom.

## BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Hints to Travellers, 6th Edition (Royal Geographical Society).—Travels in France by Arthur Young during the Years 1787, 1788, and 1789: M. Betham-Edwards (Bell).—Contributions to Canadian Palaeontology, vol. i. Part 2: J. F. Whiteaves (Montreal).—The Fauna of British India, including Ceylon and Burma; Fishes, vol. ii.: F. Day (Taylor and Francis).—The Hand-book of Jamaica for 1889-90 (Stanford).—A Treatise on Analytical Mechanics; vol. ii., Dynamics of a Material System, 2nd edition: B. Price (Oxford, Clarendon Press).—Animal Biology, 2nd edition: C. Lloyd Morgan (Rivingtons).—Notes on the Pinks of Western Europe: F. N. Williams (West).—Simple Shorthand: W. Heather (Groombridge).—The Birds in my Garden: W. T. Greene (R.T.S.).—First Mathematical Course (Blackie).—An Elementary Text-book of Geology: W. J. Harrison (Blackie).—On the Motion of the Heart and Blood in Animals: W. Harvey; Willis's Translation, revised and edited by A. Bowie (Bell).—The Rotifera or Wheel-Animacules; Supplement: C. T. Hudson and P. H. Gosse (Longmans).—The British Moss-Flora, Part 12: R. Braithwaite (published by the Author).—A Monograph of the Horny Sponges: R. von Lendenfeld (Trübner).—Records of the Geological Survey of New South Wales, vol. i. Part 2, 1889 (Sydney, Potter).

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